

NOTE: This draft, dated 09 September 2005, prepared by the Commander, Naval Air Warfare Center Aircraft Division, Code 491000B120-3, Highway 547, Lakehurst, NJ 08733-5100, has not been approved and is subject to modification. DO NOT USE PRIOR TO APPROVAL. (Project 4720-2005-017)

MIL-DTL-81581/6B

SUPERSEDING
MIL-H-81581/6A(1)
16 October 2000

DETAIL SPECIFICATION SHEET

HOSE ASSEMBLIES, BREATHING OXYGEN AND AIR; HOSE KITS AND MATED ASSEMBLIES

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The complete requirements for acquiring the hose kits or hose assembly described herein shall consist of this document and the issue in effect of MIL-DTL-81581.

1. SCOPE

1.1 Scope. This detail specification covers the additional requirements for hose kits and hoses that are part of hose kits or hoses that must be tested as mated assemblies to determine their integrity or interchangeability.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL-81581	-	Hose Assemblies, Breathing Oxygen and Air: General Specification for.
MIL-DTL-81581/1	-	Hose Assemblies, Air, Low Pressure, Highly Flexible.

Comments, suggestions, or questions on this document should be addressed to: Commander, Naval Air Warfare Center Aircraft Division, Code 491000B120-3, Highway 547, Lakehurst, NJ 08733-5100 or emailed to thomas.omara@navy.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <http://assist.daps.dla.mil/>.

MIL-DTL-81581/6B

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| MIL-DTL-81581/2 | - Hose Assembly, Breathing Oxygen, High Pressure, with Connections for an Integrated Communication System. |
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(Copies of the above specifications are available online at <http://assist.daps.dla.mil.quicksearch/> or <http://assist.daps.dla.mil/> or from the Standardization Document Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings, and publications. The following drawings form a part of this document to the extent specified herein. Unless otherwise specified, the issue of these documents are those cited in the solicitation or contract.

NAVAL AIR SYSTEMS COMMAND DRAWINGS

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| 281AS100 | - Hose Kits and Mated Assemblies Index, Breathing Oxygen and Air. |
| 284AS100 | - Hose Assembly, Oxygen, Quick Disconnect to Mask-Mounted Regulator. |
| 285AS100 | - Hose Assembly, Vent, Composite Upper Block to Connector |
| 286AS100 | - Hose Assembly, Vent, Connector to Nozzle, Full Pressure Suit. |
| 287AS100 | - Hose Assembly, Anti-G, Composite Upper Block to Connector. |
| 288AS100 | - Hose Assembly, Anti-G, Connector to Nozzle |
| 289AS100 | - Connector, Quick Disconnect, Socket. |
| 290AS100 | - Connector, Quick Disconnect, Plug. |
| 33D1349 | - Hose Assembly, Oxygen, Composite Upper Block to Quick Disconnect. |
| 63A88C2 | - Hose Assembly, Oxygen, Quick Disconnect to Full Pressure Suit Headpiece Regulator. |

(Copies of the above drawings are available from the Naval Air Technical Data and Engineering Service Command (NATEC), P.O. Box 357031, NASNI, Bldg. 90, San Diego, CA 92135-7031 or mail to: [http://nani_governmentdrawings@navy.mil/](mailto:nani_governmentdrawings@navy.mil/).)

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

AMERICAN SOCIETY FOR QUALITY

ANSI/ASQ-Z1.4

- Sampling Procedures and Tables for Inspection
by Attributes

(Copies of this document are available from <http://www.asqc.org> or American Society for Quality, P.O. Box 3005, Milwaukee, WI 53201-4606.

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Requirements. Requirements shall be in accordance with the general specification MIL-DTL-81581 and as specified herein. The requirements of this detail specification shall be additional requirements for hose assemblies acquired as kits, where the integrity of coupled assemblies must be established and where the interchangeability of hose assemblies is imperative. The requirements for tests and inspections required herein, which are not covered in the general specification or this document, shall be covered in the applicable detail specifications for the following hose assemblies:

- a. Drawings 33D1349, 284AS100, and 63A88C2 (see MIL-DTL-81581/2).
- b. Drawings 285AS100, 286AS100, 287AS100, and 288AS100 (see MIL-DTL-81581/1).

3.2 Qualification. The hose kit or hose furnished under this specification shall be a product which is qualified for listing on the applicable qualified products list at the time set for opening for bids (see 4.1.1). Qualification will be in accordance with groups as listed on Drawing 281AS100. Qualification approval of any individual hose kit or hose listed within a group will automatically qualify a manufacturer for all other items listed with the group provided the conditions set forth in 6.3 of MIL-DTL-81581 are compiled with.

3.3 First article. When specified, a sample shall be subjected to first article inspection (see 4.1.2).

3.4 Design and construction. The hose assembly shall be in accordance with the general specification and with the applicable drawing listed in the applicable group in Drawing 281AS100.

3.5 Performance. The performance of the hose assemblies shall be in accordance with the general specification and with the added performance requirements specified herein.

3.5.1 Group IA and IB hose assemblies.

3.5.1.1 Flow verification (hose assemblies with Drawing 289AS100 or 290AS100 quick disconnect). The hose assembly, when tested as specified in 4.3.1.1, shall permit oxygen flow through the proof assembly, prior to engagement of the electrical pins when engaging the disconnect of the hose assembly. Oxygen shall continue to flow through the proof assembly until after disengagement of the electrical pins, when the disconnect of the hose assembly is disengaged.

3.5.1.2 Leakage. The hose assembly, when tested as specified in 4.3.1.2, shall not exhibit a leakage rate greater than 1.00 cubic centimeter per minute per foot.

3.5.1.3 Flow check (hose assemblies with Drawing 289AS100 quick disconnect). The hose assembly, when tested as specified in 4.3.1.3, shall show no indication of leakage during the initial 3-minute period after the applicable pressure has been attained.

3.5.1.4 Pressure drop. The pressure drop through the hose assembly, when tested as specified in 4.3.1.4, shall be not greater than 5 psi.

3.5.1.5 Quick disconnect endurance. The hose assembly, when tested as specified in 4.3.1.5, shall not exhibit any distortion, difficulty in engagement or disengagement, or any other change that might affect its normal performance.

3.5.2 Group II hose assemblies.

3.5.2.1 Flow check. The hose assembly, when tested as specified in 4.3.2.1, shall show no indication of leakage.

3.5.2.2 Leakage. The hose assembly, when tested as specified in 4.3.2.2, shall show no additional indication of leakage above that specified in the applicable detail specification.

3.5.2.3 Pressure drop.

3.5.2.3.1 Hose assembly (Drawing 286AS100). When tested as specified in 4.3.2.3.1, the pressure drop across the complete hose assemblies, minus the tare value, shall be not greater than 4.5 inches of water.

3.5.2.4. Connector endurance. The hose assembly, when tested as specified in 4.3.2.4, shall not exhibit any distortion or any other change that might affect its normal performance.

3.5.3 Strength.

3.5.3.1 Tensile load. When tested as specified in the general specification, there shall be no indication of separation of the end fittings or molded ends from the hose assembly.

3.5.3.2 Static load. When tested as specified in the general specification, the hose shall not show a deflection of greater than 25 percent of original value, on the outside diameter. With the load removed, the outside diameter of the hose shall be within 5 percent of original value.

3.5.4 Restraint cord elongation and tensile strength. When the applicable control drawing specifies a restraint cord, the restraint cord shall have a 30 percent maximum elongation and a minimum tensile strength of 70 pounds, when tested as specified in the general specification.

3.5.5 Interchangeability. All hose assemblies having the same type designation shall be made mechanically and electrically interchangeable with mating parts. The interchangeability shall be determined by the following tests:

Group IA and IB hose assemblies.

Leakage

Polarity (color code) and electrical continuity, Procedure I of the general specification

Pressure drop

Flow verification

Group II hose assemblies.

Leakage

Pressure drop

4. VERIFICATION

4.1 Sampling and inspection. The sampling and inspection of the hose kit or hose assembly shall be as specified herein.

4.1.1 Qualification inspection. The following qualification inspections shall be performed for the applicable hose assemblies: For Group IIIA and IIIB hose kits, the qualification inspection shall consist of the applicable inspections for the individual hose assemblies of the hose kit and their respective individual applicable group listed on Drawing 281AS100.

4.1.1.1 Group IA and IB hose assemblies.

Visual examination

Polarity (color code) and electrical continuity, Procedure I

Insulation resistance, Procedure I

Elongation, Procedure II

Odor, Procedure I

Cleanliness, Procedure I and II

Leakage, Procedure III
Flexibility, Procedure IV (under environmental conditions, Procedure II)
Minimum burst pressure, Procedure III
Tensile load, Procedure II and Procedure III (if applicable)
Static load, Procedure I
Restraint cord elongation and tensile strength
Low temperature, Procedure I
High temperature, Procedure I
Flexibility endurance, Procedure II
Ozone-resistance, Procedure I
Abrasion, Procedure I
Flow verification
Leakage
Flow check (if applicable)
Pressure drop
Disconnect endurance
Flexibility endurance

4.1.1.2 Group II hose assemblies.

Visual examination
Elongation, Procedure I
Delamination, Procedure I
Odor, Procedure I
Cleanliness, Procedure I and II
Leakage, Procedure I
Flexibility, Procedure I (Procedure I b under environmental conditions)
Minimum burst pressure, Procedure I
Tensile load, Procedure I
Static load, Procedure I
Restraint cord elongation and tensile strength
Low temperature, Procedure I
High temperature, Procedure I
Flexibility endurance, Procedure I
Ozone-resistance, Procedure I
Abrasion, Procedure I
Weight, Procedure I
Flow check (if applicable)
Leakage
Pressure drop
Connector endurance

4.1.1.3 Qualification samples. The Group IA, IB and II qualification samples shall consist of the sample hose assemblies specified in the general specification. Group IIIA and IIIB qualification samples shall consist of four hose kits and the additional applicable samples as listed in the general specification.

4.1.2 First article inspection. The Group IA, IB and II first article inspection shall consist of the first article inspections specified in the general specification and the following inspections specified herein. For Group IIIA and IIIB hose kits, the first article inspection shall consist of the applicable inspections for the individual hose assemblies of the hose kit and their respective individual group listed on Drawing 281AS100.

Group IA and IB hose assemblies

Flow verification
Leakage
Flow check (if applicable)
Pressure drop

Group II hose assemblies

Flow check (if applicable)
Leakage
Pressure drop

4.1.2.1 First article samples. The Group IA, IB and II first article samples shall consist of the four sample hose assemblies contracted for. Group IIIA and IIIB first article samples shall consist of four hose kits of the part number contracted for.

4.1.3 Conformance inspection. The sampling and inspection levels shall conform to ANSI/ASQ-Z1.4. The conformance inspection shall consist of the inspections specified in the applicable detail specification and the following inspections:

4.1.3.1 Group IA and IB hose assemblies.

Visual examination
Polarity (color code) and electrical continuity, Procedure I
Insulation resistance, Procedure I
Elongation, Procedure II
Odor, Procedure I
Cleanliness, Procedure I and II
Leakage, Procedure III
Flexibility, Procedure IV
Flow verification
Flow check
Pressure drop

4.1.3.2 Group II hose assemblies.

Visual examination
 Elongation, Procedure I
 Delamination, Procedure I
 Odor, Procedure I
 Cleanliness, Procedure I and II
 Leakage, Procedure I
 Flexibility, Procedure I
 Flow check
 Pressure drop

4.1.3.3 Sampling.

4.1.3.3.1 Sampling for tests and examinations of the hose assemblies. The sample size, acceptance criteria, tests and examinations required for the assemblies shall be as specified in the general specification and as specified in tables I and II.

TABLE I. Sample size, acceptance criteria, tests and examinations of the hose assemblies Group IA and IB.

Inspection	Paragraph		Sample Size
	Requirement	Method	
Flow Verification	3.5.1.1	4.3.1.1	Inspection Level S-2
Leakage	3.5.1.2	4.3.1.2	Inspection Level S-2
Flow check	3.5.1.3	4.3.1.3	Inspection Level S-2
Pressure drop	3.5.1.4	4.3.1.4	Inspection Level S-2

TABLE II. Sample size, acceptance criteria, tests and examinations of the hose assemblies Group II.

Inspection	Paragraph		Sample Size
	Requirement	Method	
Flow check	3.5.2.1	4.3.2.1	Inspection Level S-2
Leakage	3.5.2.2	4.3.2.2	Inspection Level S-2
Pressure drop	3.5.2.3	4.3.2.3	Inspection Level S-2

4.2 Test conditions.

4.2.1 Proof assembly. When proof assembly is specified, the proof assembly shall be a mating hose assembly that meets the requirements of the general specification and those specified herein. The proof assembly for any given hose assembly covered by this specification, if not specified herein, shall be specified by the Naval Air Systems Command, Code 4.6.2.2.

4.2.1.1 Group IA and IB hose assemblies. The mating assembly for hose assemblies Drawings 63A88C2-2 or 284AS100 shall be hose assembly Drawing 33D1349. The mating assembly for hose assembly Drawing 33D1349 shall be hose assembly Drawing 63A88C2-2 or 284AS100.

4.2.1.2 Group II hose assemblies. The mating assembly for hose assembly Drawing 286AS100 shall be hose assembly Drawing 285AS100. The mating assembly for hose assembly Drawing 288AS100 shall be hose assembly Drawing 287AS100.

4.2.1.3 Other hose assemblies. Proof assemblies for other hose assemblies not specified herein and which are to be in accordance with the requirements included herein shall be specified on the applicable control drawing.

4.3 Inspection methods.

4.3.1 Group IA and IB hose assemblies.

4.3.1.1 Flow verification (hose assemblies with Drawing 289AS100 or 290AS100 quick disconnect attached). The hose assembly shall be subjected to a pressure of 70 ± 5 psig. The disconnect of the hose assembly shall then be engaged with, and disengaged from, the specified proof assembly. This test procedure shall be repeated 10 times. During each cycle, the hose assembly shall pass the requirements specified in 3.5.1.1.

4.3.1.2 Leakage. The disconnect of the hose assembly shall be fully engaged with the specified proof assembly, and the other end of the hose assembly shall be capped. The hose assembly shall then be subjected to the test procedure outlined in 4.7.8.3 of the general specification and shall pass the requirements specified in 3.5.1.2.

4.3.1.3 Flow check (hose assemblies with Drawing 289AS100 quick disconnect). A static pressure of 150 ± 5 psig shall be applied against the check end of the disengaged quick disconnect of the hose assembly for a period of 3 minutes. The hose assembly shall pass the requirements specified in 3.5.1.3.

4.3.1.4 Pressure drop. The quick disconnect of the hose assembly shall be fully engaged with a proof assembly. Inlet pressures of 40, 50, 70 and 90 psig shall be applied to the complete assembly and flows shall be varied at each inlet pressure from zero to 120 liters per minute (lpm) normal temperature and pressure (NPT) in 10 lpm increments. The pressure drop through the complete assembly shall pass the requirements specified in 3.5.1.4.

4.3.1.5 Quick disconnect endurance. The disconnect of the hose assembly shall be cycled 1,000 times. The engagements and disengagements shall be conducted at the rate of one cycle per three seconds using specified proof assembly. A cycle shall constitute one complete engagement and disengagement, and the locking collar of the disconnect assembly shall be given a random turn just prior to each disengagement. For hose assemblies with Drawing 289AS100 quick disconnect, the first five hundred cycles shall be conducted with 70 ± 5 psig supply pressure against the check of the quick disconnect. Upon completion of the first 500 cycles, the hose assembly shall be subjected to the following tests from the general specification:

- a. Polarity (color code) and electrical continuity, Procedure I
- b. Leakage, Procedure III
- c. Flow check (hose assembly, Drawing 33D1349)

If the hose assembly meets the requirements of the preceding tests, then endurance shall be continued without the 70 ± 5 psig applied against the check of the quick disconnect. When the endurance test has been completed, the above tests shall again be conducted. The hose assembly shall pass the requirements specified in 3.5.1.5.

4.3.2 Group II hose assemblies.

4.3.2.1 Flow check (Drawing 286AS100). A hydrostatic pressure of six feet of water shall be applied in the direction of normal flow of the disengaged female end connector of the hose assembly for a period of three minutes. The hose assembly shall pass the requirements specified in 3.5.2.1.

4.3.2.2 Leakage. The connector of the hose assembly shall be fully engaged with the specified proof assembly, and the other end of the hose assembly shall be capped. A static pressure of 2.0 psig shall be applied to the assembly for a period of three minutes. The hose assembly shall pass the requirements specified in 3.5.2.2.

4.3.2.3 Pressure drop.

4.3.2.3.1 Hose assembly (Drawing 286AS100). The specified proof assembly shall be subjected to an air flow of 300 lpm with a back pressure of 1.5 inches of mercury, and the pressure drop across the proof assembly shall be recorded as a tare value. The hose assembly (Drawing 286AS100) shall then be fully engaged with the specified proof assembly and incorporated into the same basic test apparatus. The pressure drop across the complete hose assemblies shall be recorded when subjected to an airflow of 300 lpm with a back pressure of 1.5 inches of mercury. The hose assembly shall meet the requirement specified in 3.5.2.3.1.

4.3.2.4 Connector endurance. The connector of the hose assembly shall be cycled 1,000 times. The engagements and disengagements shall be conducted at the rate of one cycle per three seconds using the specified proof assembly. A cycle shall constitute one complete engagement and disengagement. Upon completion of the 1,000 cycles, the assembly shall pass the requirements specified in 3.5.2.4. The hose assembly shall then be subjected to and pass the flow check, leakage and pressure drop tests.

5. PACKAGING

5.1 Packaging. Packaging shall be in accordance with the general specification.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The hose assemblies covered by this detail specification are hose assemblies that are hose kits or hoses that must be tested as mated assemblies to determine their integrity or ascertain their interchangeability.

6.2 Acquisition requirements. Acquisition requirements should be in accordance with the general specification.

6.3 Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this

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document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:

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Air Force - 99

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